NOTES ON MYCETOZOA FROM JAPAN.

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(Plate 458.)

In the spring of 1902, Prof. Marshall Ward enquired of Prof. Miyoshi, of the Botanical Institute, Imperial University, Tokio, whether the study of Mycetozoa had been pursued in Japan, and added that he would be grateful for any examples of the group that could be supplied to him. In October of the same year Prof. Miyoshi sent eighteen excellently preserved specimens, which Prof. Ward kindly submitted to us for examination. The list is as follows:—

Physarum polymorphum var. gyrocephalum Rost., Botanical Gardens, Tokio, leg. S. Kusano, Aug. 1901. This specimen corresponds in all respects with those from the United States; the clusters of yellow, compressed, and convoluted sporangia form somewhat globose heads, each supported on a yellowish brown stalk about 1 mm. long.

P. compressum A. & S. *l. c.*, leg. S. Kusano, July, 1901. It is the form commonly met with in Europe; the sporangia are much compressed, more or less clustered on short thick stalks, or sessile.

P. didermoides Rost. *l. c.*, leg. S. Kusano, Aug. 1899. The sporangia are crowded and sessile on a scanty, white, membranous hypothallus; the capillitium and very dark spores are typical of the species.

P. gyrosum Rost. *l. c.*, leg. S. Kusano, Sept. 1902. On dead leaves. This is an interesting gathering; there are several small clusters of compressed and confluent sporangia; they are similar to those described and figured in this Journal* from specimens supplied by Dr. Jahn from a hothouse in the University Gardens, Berlin, and from Blumenau, Brazil, recorded by him in 1902;† but the bulk of the Japanese specimen consists of a labyrinthine network of compound sporangia attaining the uniform height of about 0·7 mm., and covering an area 15 mm. across. Among the specimens from Brazil, referred to above, there is also an æthalium‡ of the same character as that described from Japan, and nearly equalling it in size; the statement in our former paper that *P. gyrosum* formed only small æthalia, though true with regard to the gatherings hitherto obtained in Germany, is thus shown to be not of universal application; for, though the Japanese growth is small as compared with the dense æthalia of *Fuligo septica*, it is large in comparison with the type in

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* Journ. Bot, 1902, p. 210, where, on line 41, for 0·2–0·3 mm., read 2–3 mm.

† Ber. Deut. Bot. Ges. 1902, Bd. xx. Hft. 5, p. 272, fig. 4.

‡ The term æthalium is here used for convenience, though not in all cases strictly applicable.

the Strassburg collection and those from Berlin; the capillitium and spores, 8 μ diam., are similar to those in former gatherings.

ERIONEMA AUREUM Penzig, Pl. 458, *l. c.*, leg. S. Kusano, Sept. 1902. This gathering represents the second recorded occurrence of the species; the first was obtained by Prof. Penzig in Java in December, 1896, and was described by him in his account of the Mycetozoa of the Buitenzorg Gardens.* The minute round granules of lime composing the calcareous deposit of the sporangium-wall and the presence of lime-knots in the capillitium indicate the close relation of this form with the genus *Physarum;* but the reasons given by Prof. Penzig may warrant its being placed in a separate genus. The specimen from Japan presents precisely the same characters as that from Java, and, as no figure has hitherto been published, we give a plate to illustrate its exceptional habit. The prominent features are the bright yellow cylindric and often branching sporangia, and the remarkable capillitium. The latter consists of a uniform, close, elastic network of very slender colourless threads, interspersed with a few scattered yellow lime-knots; on maturity the column of capillitium expands longitudinally, often to several times its original length, carrying with it fragments of the sporangium-wall; this is strikingly seen in the bunches of pendulous sporangia which are connected by long branching yellow stalks. The spores are violet-brown, minutely spinulose under the $\frac{1}{15}$ in. obj., and measure 6–7 μ diam. Some ecorticate forms of *Fuligo septica* show a near relationship to *Erionema*.

DIACHÆA ELEGANS Fr. *l. c.*, leg. S. Kusano, July, 1898. Quite typical. This widely-spread species is very constant in its characters; specimens from Europe, N. and S. America, India, Central and S. Africa, and Australia show little or no variation.

DIDYMIUM DIFFORME Duby, var, COMATUM, *l. c.*, leg. S. Kusano, Aug. 1898. This specimen is the variety described in a previous article in this Journal.† The sporangia are of the usual form met with in this country; the capillitium consists of crowded, straight, colourless, anastomosing threads; they are of equal thickness throughout their length, and do not taper upwards from a thickened base, as in the typical form. In January, 1903, we met with this variety in abundance on dead fern and nettle leaves on the Undercliff, Lyme Regis; the normal form was also present, but sparingly; several sporangia had capillitium of intermediate character showing various stages connecting the profuse slender threads of the var. *comatum* with those of the normal type; this confirms the view that the var. *comatum* is not a distinct species.

D. NIGRIPES var. XANTHOPUS Fr. *l. c.*, leg. S. Kusano, Aug. 1898. On decaying herbaceous stalks. Typical.

STEMONITIS FUSCA Roth, *l. c.*, leg. S. Kusano, Aug. 1901. On grass. The sporangia are 6 mm. in total length; the capillitium

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* *Die Myxomyceten der Flora von Buitenzorg*, 1898, p. 37.

† "On Cultivation of Mycetozoa from Spores," Journ. Bot. 1901, p. 8.

is normal; the spores are pale purple-brown, minutely reticulate with about six meshes across the hemisphere, and measure 6–7 μ diam.

S. HERBATICA Peck, *l. c.*, leg. S. Kusano, Aug. 1899. Total height 4 mm., the stalks equalling the sporangia in length; the meshes of the surface-net of the capillitium are small, measuring 10–20 μ across; spores 6–7 μ diam., pale purplish brown, nearly smooth.

S. SPLENDENS Rost. *l. c.*, leg. S. Kusano, Aug. 1898. A slender form; the meshes of the surface-net measure about 30–40 μ across; spores 7 μ diam., pale purplish, minutely spinulose.

COMATRICHA LONGA Peck, *l. c.*, leg. S. Kusano, Sept. 1902. A beautifully typical specimen. *C. longa* is not unfrequent in several of the Eastern States of North America, and has been obtained in the West Indies, Nicaragua, Brazil, and also in Java; the earliest gatherings of this species we are acquainted with were made by Welwitsch in West Africa in December, 1855, and August, 1857. He named it *Sternonitis æquinoctialis* Welw., but the name was not published. These specimens are in the British Museum Collection, and are precisely similar in character to that from Japan.

LAMPRODERMA ARCYRIONEMA Rost. *l. c.*, leg. S. Kusano, Aug. 1898. This is a delicate form with slender capillitium; it is similar to the specimen from Epping Forest figured in Brit. Mus. Cat. Myc. pl. xlviii.; in examples from the United States, where the species is common, the threads are usually coarser.

TUBULINA FRAGIFORMIS Pers. *l. c.*, leg. S. Kusano, Aug. 1899. This is the typical form met with in Europe and America.

ARCYRIA ALBIDA Pers. *l. c.*, leg. S. Kusano, Aug. 1901. On dead wood. The capillitium is minutely warted, and is of the type most frequently met with in this country. The sporangia are shortly cylindrical, and are either simple, or clustered on a column of the combined stalks; the clustered form is usually found in warm climates, where the sporangia sometimes attain a great length; it has been given specific rank as *A. digitata*, but is doubtfully deserving of even a varietal name.

A. PUNICEA Pers. *l. c.*, leg. S. Kusano, Aug. 1901. Typical.

LYCOGALA MINIATUM Pers. *l. c.*, leg. S. Kusano, Aug. 1901. Typical.

L. FLAVO-FUSCUM Rost. *l. c.*, leg. S. Kusano, July, 1899. A firm æthalium measuring 32 mm. diam.; typical.

DESCRIPTION OF PLATE 458.

Erionema aureum Penzig. — *a*. Sporangia, × 20. *b*. Capillitium with fragment of sporangium-wall and spores, × 280. *c*. Spores, × 600.
